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GREEN CALCITE FROM GLENS FALLS, NEW YORK.[1]

LOUIS H. KOCH.

Philadelphia, Pa.

Specimens of a green silicate and a green carbonate mineral were recently received by the U. S. National Museum for examination and report. They were identified by Dr. Wherry as uvarovite, (chromium garnet) and calcite respectively. The source of the unusual color of the latter mineral seemed worth further investigation, and the writer, being at the time employed as private assistant to Dr. George P. Merrill, Head Curator of the Division of Geology, undertook an analysis of it in the Museum laboratory.

The material shows typical calcite cleavage, the surfaces being crossed by widely spaced twinning lamellas. The color is very pale yellow-green, corresponding approximately to Ridgway's "corydalis-green," which consists of 11% green, 6% yellow, 5% white and 78% gray. It is transparent in places tho for the most part rendered translucent by white, cloudy material; but no definite inclusions were present in the specimen studied.

It has recently been shown that the red-violet color of some calcites is due to a trivalent element, neodymium[2], so it was thought that the green color in this case might be due to trivalent chromium.

A large sample (36 grams) was dissolved in dilute hydrochloric acid, the slight silicious residue filtered off and discarded, the sesquioxides precipitated with ammonia, filtered, dried, and fused with sodium carbonate. The fusion was extracted with water, filtered, and compared with a standard chromate solution; the presence of 0.0003% of Cr_2O_3 was indicated. Traces of manganese and of ferrous iron were also found to be present; no vanadium could be detected.

It is not believed that the manganese or the iron could give rise to any green color in the calcite, since manganese carbonate, rhodochrosite, is red, and ferrous carbonate, siderite, is gray or brown; so the chromium, minute tho it is in amount, is regarded as the most-probable cause of the color.

[1] Published by permission of the Secretary of the Smithsonian Institution.

[2] Edgar T. Wherry, *J. Wash. Acad. Sci.*, 7, (6), 143-145, 1917.

GEL MINERALS (COLLOID MINERALS)

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(*Continued from page 115*)

Considering, then, only the dispersoids Nos. 4 and 5, the division made by A. A. Noyes, as follows, has been very widely accepted. He distinguishes two sub-classes of colloidal mixtures: (1) That represented by an aqueous solution of gelatin, and (2) colloidally suspended arsenious sulfide.

SUBCLASS 1. Gelatinizes upon cooling or evaporation. Does not coagulate upon the addition of salts (electrolytes) unless in large amount.	SUBCLASS 2. Does not gelatinize upon cooling and if gelatinized by other means it does not redissolve upon heating. Gives an abundant precipitate upon the addition of a salt.
Have usually a lower surface tension than their pure dispersion-means. Viscous, gelatinizing colloidal mixtures, not coagulated by salts.	Surface tension practically unchanged. Electrical factors usually play a more important role here. Non-viscous, nongelatinizing but readily coagulable mixtures.
COLLOIDAL SOLUTIONS. *Examples.* Proteins, gelatin, agar—agar, cholesterol, salicylic acid, metaphosphoric acid, hydroxides in concentrated solution, so-called gelatinous salts (sulfates, phosphates, carbonates, etc.) and some dyestuffs like "night-blue."	COLLOIDAL SUSPENSIONS. *Examples.* Metallic sols, sulfide sols, many dyestuffs (Congo red) iron hydroxide in dilute solution.

Noyes[9] in a presidential address delivered before the American Chemical Society in 1905, says: "In accordance with the general use of the term, colloidal mixtures are most simply defined as liquid (or solid) mixtures of two (or more) substances which are not separated from one another by the action of gravity however long continued, nor by filtration thru paper, but which are so separated when the liquid is forced thru animal membranes, the substances remaining behind being designated as colloids."

The following table shows the relative size of particles in true solutions, colloidal solutions, and colloidal suspensions.

TABLE I.

<table>
<tr><td>0.1 μμ</td><td>1 μμ</td><td>10 μμ</td><td>100 μμ</td><td>1000μμ</td><td>10 μ</td><td>100 μ</td><td>1 mm</td></tr>
<tr><td colspan="3">Ultramicroscopic Province</td><td colspan="5">Microscopic Province
The particles have outlines which can be recognized.</td></tr>
<tr><td colspan="3">Quartz which does not settle.</td><td colspan="5">Quartz which settles.</td></tr>
<tr><td colspan="8">Oil Particles in Water</td></tr>
<tr><td colspan="3">Do not rise to surface</td><td colspan="5">Do rise to surface and form a scum</td></tr>
<tr><td colspan="8">Brownian Movements.</td></tr>
<tr><td colspan="3">Particles have a very lively movement.</td><td colspan="2">Slow movement.</td><td colspan="3">Particles have very little or no movement.</td></tr>
<tr><td colspan="2">Crystalloid solutions.</td><td>Colloidal solutions.</td><td colspan="2">EMULSOIDS.</td><td colspan="3">SUSPENSOIDS.</td></tr>
</table>

Primarily the mineralogist is concerned, not with the colloidal solutions and suspensions themselves, but with their product, namely, gels. It has been the customary thing among writers in English to call these minerals which have been believed to have been produced from colloidal solutions or suspensions "Colloidal minerals." The German writers, on the other hand, use the term "*Gelmineralien*," which, in the opinion of the writer, is much more appropriate.

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[9] *J. Am. Chem. Soc.*, **27**, 85, 1905

"The gels of the mineral kingdom are the typical products of normal weathering processes, whether they present themselves in the silicate rock or in the oxidation zone of ore deposits under the influence of strong electrolytes."[10]

Gel minerals, then, are the products of oxidation, hydration, carbonation, and silicification in the zone of katamorphism, in the belts of both weathering and cementation. The one exception to this is the occurrence of gel minerals as the product of hot springs. We have, then, as Cornu pointed out, the following modes of occurrence:

(a) The normal weathering products of rocks.
(b) In the oxidized zone of ore deposits.
(c) In hot spring deposits.

They are low temperature, low pressure, minerals, which accounts for their gel condition. The mammillary, botryoidal, reniform, stalactitic and rod-like shapes assumed are characteristic, and in large part the means of identifying them. "*Glaskopf*" of German writers is a useful descriptive term for material showing such structures. The imitative shapes are assumed when the development of the mineral has not been hindered for lack of space; when crowded the following structures also occur: Earthy (magnesite); soapy; and dendritic (stilpnosiderite, psilomelanite). In many cases drying cracks are found. Some, upon loss of water, will adhere to the tongue. This property is due to the fact that they are strongly hydroscopic. In a few cases they are actually found in a jelly-like condition in nature (opal, pitticite, plombierite).

Optically, gel minerals are usually isotropic, but often show double refraction due to strain (hyalite, chrysocolla). Those which have lost their water give the appearance of cloudy or turbid media. Aggregate and spherulitic structures sometimes occur. Under the microscope such gels are hard to identify with certainty.

Little seems to be known concerning the origin of these minerals and in this connection there is a large field for research. Chemical composition does not determine whether a substance goes into solution as a molecular dispersoid (true solution) or as a colloid. Wo. Ostwald points out that it is the different physical properties, such as solubility, which determine the variations in degree of dispersion. In nature, then, it is the physical condition under which gel minerals are produced which accounts for the fact that we find one and the same substance both as a crystalloid and as a colloid.

(*To be continued*)

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10 Cornu, *Z. Chem. Ind. Kolloide,* **4**, 16, 1909.

APPARENT CLEAVAGE IN CRIPPLE CREEK TELLURIDE (CALAVERITE)

J. TERRY DUCE
Denver, Colo.

Every mineralogist who visits the Cripple Creek district is astonished by the frequency with which assayers report sylvanite. Lately the writer has had the privilege of looking over about fifteen hundred specimens assembled from almost every mine in the district. A few specimens of telluride ores from the Blue Bird and Gold Coin Mines seemed to exhibit a cleavage. The telluride formed silvery scale-like coatings on the surfaces of joints in the phonolite, and the individual grains were striated on their larger surfaces by lines that strongly resembled those characteristic of sylvanite. To make the matter more certain, the mineral exhibited what appeared to be an excellent cleavage (calaverite normally showing none). Upon testing a small fragment with the blow-pipe, and parting the resulting button, no appreciable silver was obtained; and a fire assay confirmed this result. This suggested either a new gold telluride or an intergrowth with some other mineral. A number of small fragments of the material were then roasted in a muffle, and the explanation of the "cleavage" immediately became apparent. Extremely thin, transparent, anisotropic quartz films appeared, stripped of their telluride covering, and an examination of the specimens with a lens showed that these were the cause of the apparent cleavage. They occurred parallel with the surface of each telluride grain, were thinner than paper, and along them the mineral split. The films are especially remarkable for their parallel orientation and their repetition within individual grains. The latter phenomenon suggests pulsations in the deposition of the ore minerals. This would indicate that there was within the veins a quick alternation of highly heated vapors and circulating waters, if the emanation theory of Lindgren and Ransome is correct. It is quite possible, however, that hydrofluoric acid gas may have extracted silica from the wall rock as vaporous hydrofluosilicic acid, and some reaction may have taken place to cause deposition of silica.

Supplementary Note on Thaumasite. Edgar T. Wherry. *Washington, D. C.*

Since the appearance of my note on "Terminated crystals of thaumasite"[1] there has been received in this country from Stockholm, Sweden, a number of the *Geologiska Föreningens Förhandlingar* containing an article by Dr. G. Flink on the same mineral.[2] The angle ρ_p of his crystals averaged 47° 35′, which, it is worth noting, is only 30′ more than my result, and within the limit of error of my measurements; the corresponding axial ratio being $c = 0.948$. The matter will be further discussed in my paper in the Proceedings of the U. S. National Museum.

[1] *Am. Min.*, **2**, (7), 89, July, 1917. [2] *Geol. Fören. Förh.*, **39**, (4), 447, April, 1917.

AN ELEMENTARY INTRODUCTION TO CRYSTALLOGRAPHY.

J. P. WINTRINGHAM.

Brooklyn, N. Y.

(*Continued from page 118*)

Do not forget to note that the symbols of the three fundamental forms taken singly represent: 100, a pinacoid; 110, a prism face; and 111, a pyramid face.

A pinacoid with two 0's cuts one axis and is parallel to two axes; a prism face with one 0 is parallel to one axis and cuts two; and a pyramid without any 0's cuts all three axes. This rule enables one at once to recall how any face lies, and to give the proper name to the face; or, having a named face, to give it an approximate symbol.

Any face with a dash over its first symbol lies at the back of a crystal; all without are in front. All without a dash over the second symbol are to the right of the *a* axis; if without a dash on the third symbol, above the *b* axis.

The student should know what kind of faces the following are: 100, 410, 310, 210 and 110. They are all in one zone. Note that 410 is a face slanting only slightly from the front pinacoid 100. Write the series 120 to the side pinacoid 010, also $\bar{1}40$ to the back pinacoid $\bar{1}00$. Continue in the same way to the other side pinacoid $0\bar{1}0$, and to the front pinacoid 100 again.

Such a series as 010, 041, 031, etc., could be represented by drawing the *b* and *c* axes as two lines on paper at right angles to each other and 12 inches long from the center. At 6 inches out from the center mark them 2, at 4 inches out 3, and at 3 inches out 4; the outer ends mark 1. Join the 1, (or 010) to the 1 (or 001) and also the 1, (010) to each of the other points 2, 002 the 3, 003 and the 4, 004 that would give you the slant of the faces 011, 012, 013 and 014 tho not their position. To get a clear idea of the series of faces draw a line at the end of the *c* axis parallel to the *b* axis this would represent the face 001. At 2 inches from the *c* axis on this line draw a second line parallel to the 014. From 2 inches further along on this second line draw a third parallel to 013. In the same way draw 012 and 011. This can be easily done with a pair of parallel rulers. Complete this quadrant by starting at 010, drawing four lines to where the 021 line meets the 011 line. See diagram on the following page.

If desired, complete the other three quadrants. The point to observe here is that the first set of lines drawn as indicated by the symbols give the directions, tho not the positions of the faces. In the isometric or cubic system, perfect crystals tend to have equal faces and be about equally thick each way, but this is not at all essential.

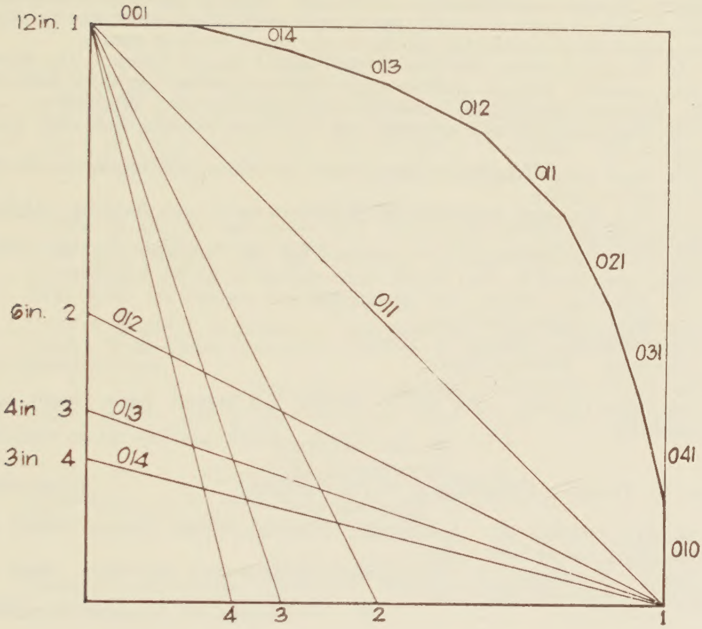

Figure 1. The Method of Drawing the Zone 010—011—001.(x¼)

PROCEEDINGS OF SOCIETIES

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, September 13, 1917.

President Trudell in the chair. Fourteen members present.

Mr. Warford reported a trip to Leiper's quarry and Crum Lynne, finding beryl, garnet, tourmaline, and microcline at the former locality, and heulandite, laumontite, argentine, and stilbite at the latter place. He also reported a trip to the Perkiomen mines which produced very little. The mines have not been worked for perhaps half a century, and little is obtainable on the dumps.

At Overbrook, Messrs. Oldach, Warford, Gushee and Gordon found numerous small crystals of quartz, of a very modified type.

Mr. Oldach reported the results of the Society's trip to Friedensville and Hellertown. At Friedensville good calamine was obtained, and small crystals of limonite pseudomorph after pyrite noted. At Hellertown, cacoxenite, beraunite, and wavellite in good specimens were obtained. A visit was paid to the small limestone cave there.

Several trips to Rolandville, Philadelphia were taken by Messrs. Oldach, Warford, Gushee and Gordon. Extensive digging operations produced quartz crystals, masses of limpid quartz, and very fine specimens of brilliant red to almost black reticulated groups of needles of rutile in quartz.

Mr. Trudell reported the trip to the Falls of French Creek. The mines are now actively worked, and specimens of magnetite, pyrite, sphalerite, calcite, gypsum, apophyllite, laumontite and byssolite were obtained.

Mr. Vanartsdalen took several trips to Moore Station, but with little success.

Mr. Koch told of recent investigations in the National Museum on Merrillite, and green calcite.

Mr. L. J. Herwegh described the Kutztown cave, near Reading, exhibiting fine specimens.

Mr. Hugh E. McKinstry, nominated by Mr. Gordon, and Mr. L. J. Herwegh, nominated by Mr. Flack, were elected to active membership.

The following officers were nominated and elected for 1917–1918:

President: Henry Leffman

Vice President: Harry W. Trudell

Treasurer: William Knabe

Secretary: Samuel G. Gordon

Executive Council: The above officers, and Messrs. Egee, Groth, and Vanartsdalen.

STATED MEETING

November 8, 1917

Harry W. Trudell: Collecting in North Carolina. Illustrated.

EXCURSIONS:

Sunday, October 26. Leiperville, Avondale, Crum Lynne. Meet at 69th St. Terminal at 8.45 A. M.

Sunday, November 4. Brandywine Summit and Fairville. Meet at Broad St. Station at 7.30 A. M.

SAMUEL G. GORDON, *Secretary.*

THE MINERALOGICAL SOCIETY (OF GREAT BRITAIN)

London, June 19. Mr. W. Barlow, President in the Chair. Dr. G. F. H. Smith: The Problem of Sartorite. Dr. A. Scott: Note on a Curious Case of Devitrification. Dr. G. T. Prior: The Meteorites of Simondium, Eagle Station, and Amana. Nature, 2488, 379, 1917.

NOTES AND NEWS.

Mr. Hugh E. McKinstry of West Chester, Pennsylvania, has gone to France with a Friends' (Quaker's) Reconstruction Unit.

Dr. Alfred C. Hawkins, oil geologist, has left Bartlesville, Oklahoma, and now has his headquarters at Houston, Texas.

The death is announced of Dr. Charles O. Trechmann, a British crystallographer; in 1905 a rare sulfo-salt mineral was named in his honor, Trechmannite.

NEW MINERALS

Ectropite

GUSTAV FLINK: *Ektropit, a new mineral from Longbanshyttan*, in *Some novelties in the mineralogy of Sweden, Geol. Fören. Förh.*, **39**, *426, 1917.*

NAME: from Greek *ektrope*, evasive, because of the uncertainty as to its composition, relationship, etc.

PHYSICAL PROPERTIES

Color: brown; Luster: vitreous to silky. H=4. Sp. Gr.=2.46.

CRYSTALLOGRAPHIC PROPERTIES

Monoclinic. $a : b : c = 0.74 : 1 : 0.84$; $\beta = 61° 5'$.

Cleavable parallel to the base.

OPTICAL PROPERTIES

Under the microscope, yellow, non-pleochroic, with the refractive indices: $\alpha = 1.62$, $\beta = 1.625$, $\gamma = 1.63$, approx.

CHEMICAL PROPERTIES

Soluble in acids, leaving white silica residue.

Analysis by Naima Sahlbom on 0.6 grams fairly pure material: H_2O—8.89, SiO_2 35.02, Al_2O_3 0.75, FeO 5.80, MnO 37.20, CaO 3.59, MgO 7.20, Na_2O 0.12, K_2O 1.13, other metals 0.19, sum 99.89%. Formula: $Mn_{12}Si_8O_{28}.7H_2O$; or, $12MnO.8SiO_2.7H_2O$. Most nearly related to caryopilite.

OCCURRENCE

Occurs on garnet associated with barite and calcite in the Norbotten iron mine. Probably to be classed as a contact metamorphic mineral.

E. T. W.

Catoptrite

GUSTAV FLINK: *Katoptrit, a new mineral from Nordmarken, loc.cit.*

NAME: from Greek *katoptron*, a mirror, in reference to the brilliance of the cleavage faces.

PHYSICAL PROPERTIES

Color: black, but in thin splinters, red; Luster, metallic, especially brilliant on the cleavage faces. H = 5.5. Sp.Gr. = 4.5.

CRYSTALLOGRAPHIC PROPERTIES

Monoclinic. $a : b : c = 0.7922 : 1 : 0.4899$; $\beta = 78° 57'$.

Cleavage, very perfect parallel to a (100).

OPTICAL PROPERTIES

Under the microscope, pleochroic, red-brown to red-yellow. Dispersion inclined, strong. Axial angle small. Sign+.

CHEMICAL PROPERTIES

Not attacked by acids.

Analysis by R. Mauzelius gave: SiO_2 7.75, Sb_2O_5 20.76, Al_2O_3 9.50, Fe_2O_3 3.58, FeO 2.44, MnO 52.61, MgO 3.06, CaO 0.58, H_2O 0.11, sum 100.39%.

Formula: $2SiO_2.Sb_2O_5.\ 2(Al,Fe)_2O_3.14\ (Mn,Fe,Ca)O$. Related to manganostibiite and hematostibiite, yet distinct from either.

OCCURRENCE

Occurs in granular limestone with magnetite and other minerals, and is best obtained by dissolving the rock away with hydrochloric acid. Formed by contact metamorphism.

E. T. W.

ABSTRACTS OF MINERALOGICAL LITERATURE

SOME NOVELTIES IN THE MINERALOGY OF SWEDEN. GUSTAV FLINK. *Geol. Fören. Förh.*, **39**, *426—452, 1917.*

Includes descriptions of two new minerals, noted under that heading, and the following:

Margarosanite from Longbanshyttan. This mineral had been found here before described by Ford and Bradley from Franklin Furnace (see *Am. Min.*, **1**, *(5) 87–88, 1916*). It occurs associated with nasonite, schefferite, apophyllite and thaumasite in the Lukas Ort and Bjelkes shaft. It is mostly columnar, but a few good crystals have been obtained, which are triclinic (as suggested by Ford and Bradley) with: $a : b : c = 0.7500 : 1 : 1.2849$; $\alpha = 74° 37'$, $\beta = 50° 28'$, $\gamma = 78° 53'$. Analysis gave essentially identical results to those of Ford and Bradley. It represents an isolated member of the pyroxene group.

Thaumasite from Longbanshyttan. This, the fourth Swedish occurrence of the mineral, is associated with garnet, apophyllite, barite, calcite, and ferruginous quartz. It varies from compact massive to friable-crystalline; two measureable crystals were obtained, on which the axial ratio $c=0.9479$ was determined. The description of the material shows it to bear a striking resemblance to that from New Jersey, even to the abundance of minute doubly-terminated crystals with dull base and striated prism. E. T. W.

AURICHALCITE FROM BIG COTTONWOOD CANYON, SALT LAKE COUNTY, UTAH. A. Ledoux, Univ. of Brussels; *J. Wash. Acad. Sci.*, 7, (12), 361–365, 1917.

A crystallographic examination of minute fragments. S. G. G.

THE INDICES OF REFRACTION OF ANALYZED RHODOCHROSITE AND SIDERITE. Edgar T. Wherry, U. S. National Museum, and Esper S. Larsen, U. S. Geological Survey. *J. Wash. Acad. Sci.* **7**, (12), 365–368, 1917.

Analysis of crystallized rhodochrosite from the John Reed Mine, Alicante, Lake Co., Colo., gave E. T. W. $MnCO_3$ 95.72, $FeCO_3$ 1.87, $CaCO_3$ 0.50, $MgCO_3$ 0.68, gangue 0.82, sum 99.59 per cent; Sp. Gr. 3.71. The indices of refraction (E. S. L.) measured by immersion were $\omega=1.817\pm0.003$, $\varepsilon=1.595\pm0.005$. Since the Fe, which raises the indices, is present in about the same proportion as Ca and Mg, which lower them, these values must be close to those of pure $MnCO_3$.

The indices of refraction of analyzed siderite from two localities were also determined; Ivigtut, Greenland: $\omega=1.871$, $\varepsilon=1.631$; Spokane, Wash.: $\omega=1.858$, $\varepsilon=1.622$; all ±0.005. From these and other observations it is concluded that the values for pure siderite are $\omega=1.875$, $\varepsilon=1.635$. S.G.G.

A REMARKABLE OCCURRENCE OF CALCITE IN SILICIFIED WOOD. Edgar T. Wherry. *Proc. U. S. Nat. Mus.* **53**, 227–230, 1917.

Description of minute calcite crystals in silicified wood from Yellowstone National Park. (Copies obtainable from author on request.) S. G. G.

THE DEVITRIFICATION OF LEAD GLASS. Henry Le Chatelier. *Bull. soc. franc. min.* **39**, 150–153, 1916. Abstract by P. A. v. d. Meulen, reprinted by permission from *Chem. Abstr.*, **11**, (2), 131, 1917.

Owing to peculiar circumstances, a number of crucibles containing molten lead glass at a temperature of 1350° were cooled extremely slowly. These were then broken and the glass found to contain very thin hexagonal plates of tridymite. L. concludes that cristobalite is a metastable phase of SiO_2.

RELATIONS EXISTING BETWEEN THE HABIT AND THE CONDITIONS OF CRYSTALLIZATION OF TRIDYMITE. A. Lacroix. *Bull. soc. franc. min.* **39**, 154, 1916. Abstract by P. A. v. d. Meulen, reprinted by permission from *Chem. Abstr.*, **11**, (2), 131, 1917.

L. formerly held the view that tridymite crystallized in thin plates only when produced under the influence of pneumatolytic agencies. The artificial production of thin plates of tridymite from a lead glass fusion (preceding abstract) indicates that this view is no longer tenable.